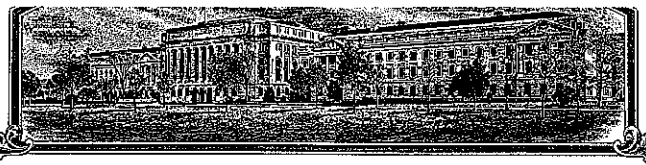
No. 9900410



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

ALFALFA

'54V54'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-fourth day of April, in the year of our Lord two thousand one.

Attest:

Alan R. Post

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Pioneer Hi-Bred International, Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER
X54V54

3. VARIETY NAME
54V54

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
7305 N.W. 62nd Ave.
P.O. Box 287
Johnston, IA 50131

5. TELEPHONE *(include area code)*
(515) 270-3347

6. FAX *(include area code)*
(515) 270-3750

FOR OFFICIAL USE ONLY

PVPO NUMBER: 9900410

FILING DATE: Sept. 13, 1999

FEES RECEIVED
FILING AND EXAMINATION FEE: $ 2450.00
DATE: Sept 13 1999
CERTIFICATION FEE: $ 320.00
DATE: 4/13/01

7. GENUS AND SPECIES NAME
Medicago sativa

8. FAMILY NAME *(Botanical)*
Leguminosae

9. CROP KIND NAME *(Common name)*
Alfalfa

10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.) (Common name)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

12. DATE OF INCORPORATION
May 6, 1926

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

David J. Miller
7305 N.W. 62nd Ave.
P.O. Box 287
Johnston, IA 50131-0287

Mary Letsch
Dept. of Alfalfa Research
7305 N.W. 62ND Ave.
Johnston IA 50131

Jean M. Bromert
7100 NW 62nd Avenue
P.O. Box 1000
Johnston, IA 50131-1000

14. TELEPHONE *(include area code)*
(515) 270-3347

15. FAX *(include area code)*
(515) 270-3750

16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*

- a. ☑ Exhibit A. Origin and Breeding History of the Variety
- b. ☑ Exhibit B. Statement of Distinctness
- c. ☑ Exhibit C. Objective Description of the Variety
- d. ☑ Exhibit D. Additional Description of the Variety (Optional)
- e. ☑ Exhibit E. Statement of the Basis of the Applicant's Ownership
- f. ☑ Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in an approved public repository)*
- g. ☑ Filing and Examination Fee ($2450), made payable to "Treasurer of the United States" *(Mail to PVPO)*

17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*

☐ YES *(If "yes," answer items 18 and 19 below)* ☑ NO *(If "no," go to item 20)*

18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO

19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☑ YES *(If "yes," give names of countries and dates)* ☐ NO Spring, 2000 USA

21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*		SIGNATURE OF APPLICANT *(Owner(s))*	
David J. Miller			
NAME *(Please print or type)*		NAME *(Please print or type)*	
David J. Miller			
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
Research Coordinator	9/3/99		

STD-470 *(Previous editions are to be destroyed)* *(See reverse for instructions and information collection burden statement)*

9900410

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF THE VARIETY

'54V54'

54V54 is a 20 clone synthetic variety with seed of each parent bulked equally. Breeder seed (syn. 2) was produced on 223 plants under cage isolation in Connell, WA during the summer of 1993. Parental material was selected phenotypically for resistance to one or more of the following pests: bacterial wilt, *Fusarium* wilt, *Verticillium* wilt, *Phytophthora* root rot, anthracnose (race 1), *Aphanomyces* root rot (race 1), and spotted alfalfa aphid. In addition, parent clones were selected genotypically for forage yield, forage quality, fall dormancy, regrowth vigor, and persistence. 54V54 traces to the following germplasm sources: 5331 (13%), Apollo (6%), 526 (5%), 5262 (5%), 532 (4%), NCMP10 (4%), DK120 (3%), Saranac AR (3%), 545 (3%), Apollo II (2%), Anchor (2%), WL316 (2%), 524 (1%), 5444 (1%), Conquest (1%), Mercury (1%), 5432 (1%), Culver (1%), Vernal (1%), with minor contributions (totaling 2.5%) from: Team, Armor, Narragansett, Cherokee, Saranac, ATRA 55, MSB-W4, Magnum, Futura, 555, Endure, 5364, Iroquois, Arnim and others. The remaining 40.5% traces to various Pioneer experimentals. Original germplasm sources are as follows: M. falcata (2.6%), Ladak (4.0%), M. varia (12.7%), Turkistan (2.1%), Flemish (25.3%), Chilean (2.9%) and unknown (50.4%).

This variety was observed over three generations and found to be uniform and stable.

No variants were observed during seed (breeder, foundation and commercial) multiplication procedures.

It is confirmed that 54V54 meets presently acceptable levels for uniformity for alfalfa varieties.

EXHIBIT B

NOVELTY STATEMENT

'54V54'

54V54 most closely resembles the variety 5454. 54V54 differs from 5454 primarily in its disease profile. Differences occur in the resistance ratings for the following: Verticillium wilt (54V54 = 61.0%, 5454 = 22.8%), Bacterial Wilt (54V54 = 59.1%, 5454 = 47.8%), Aphanomyces Root Rot (54V54 = 18.2%, 5454 = 8.3%), and Stem Nematode (54V54 = 7.6%, 5454 = 28.9%).

These two varieties also differ in flower color: 54V54 has 80% purple, 19% variegated, 1% yellow and traces of cream and white, and 5454 has 96% purple, 4% variegated, and traces of yellow, cream and white.

FORM APPROVED OMB NO. 0581 0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(ALFALFA)

OBJECTIVE DESCRIPTION OF VARIETY
ALFALFA *(Medicago sativa* sensu Gunn et al.)

NAME OF APPLICANT(S)	TEMPORARY DESIGNATION	VARIETY NAME
Pioneer Hi-Bred International, Inc.	X54V54	54V54

ADDRESS *(Street and No., or R.F.D. No., City, State, and Zip Code)*
7305 N.W. 62nd Ave., P.O. Box 287
Johnston, IA 50131

FOR OFFICIAL USE ONLY
PVPO NUMBER 9900410

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place numbers in the boxes to designate the expressions which are characteristic of the commerical generations of the application variety. Data for quantitative plant characters should be based on a minimum of 100 plants. Include leading zeros when necessary (e.g. [0][8][9] for quantitative data. Comparative data should be determined from varieties entered in the same trial.Plant color may be precisely designated by using any recognized color chart.e.g., The Munsell Plant Tissue Color Charts.

1. WINTERHARDINESS:

[8] CLASS:

1 = Very Non-Winterhardy (CUF 101)
2 = Non-Winterhardy (Moapa 69)
3 = Intermediately Non-Winterhardy (Mesilla)
4 = Semi-Winterhardy (Lahontan)
5 = (Du Puits)
6 = Moderately Winterhardy (Saranac)
7 = (Ranger)
8 = Winterhardy (Vernal)
9 = Extremely Winterhardy (Norseman)

TEST LOCATION: Eau Claire, WI

2. FALL DORMANCY:

FALL DORMANCY (DETERMINED FROM SPACED PLANTINGS)

TESTING INSTITUTION AND LOCATION	DATE OF LAST CUT	DATE REGROWTH SCORED	REGROWTH SCORE OR AVERAGE HEIGHT				LSD .05
			APPLICATION VARIETY	CHECK VARIETIES*			
				Ranger	Saranac	Vernal	
Pioneer Hi-Bred International, Inc. Arlington, WI	8/94	10/94	29.7	29.0	30.0	21.5	2.6

* CUF 101, Moapa 69, Mesilla, Lahontan, Du Puits, Saranac, Ranger, Vernal, or Norseman as appropriate.

Specify scoring system used: Natural plant height in cm.

[5] Fall Growth Habit (Determined from Fall Dormancy Trials)

1 = Erect (CUF 101)
3 = Semierect (Mesilla)
5 = Intermediate (Saranac)
7 = Semidecumbent (Vernal)
9 = Decumbent (Norseman)

3. RECOVERY AFTER FIRST SPRING CUT (In Southwest, first cut after March 21):

[3]

1 = Very Fast (CUF 101)
3 = Fast (Saranac)
5 = Intermediate (Ranger)
7 = Slow (Vernal)
9 = Very Slow (Norseman

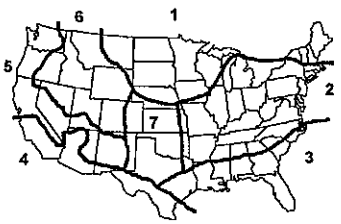
TEST LOCATION: Arlington, WI

4. AREAS OF ADAPTATION IN U.S. (Where tested and proven adapted):

[1] Primary Area of Adaptation

[2] [6] Other Areas of Adaptation

1 = North Central
2 = East Central
3 = Southeast
4 = Southwest
5 = Moderately Winterhardy Intermountain
6 = Winterhardy Intermountain
7 = Great Plains
8 = Other *(Specify)*



5. FLOWERING DATE (When 10% of plants possess open flowers at time of first spring cut):

[ ][ ] Days Earlier Than . . . . . [ ]
Same As . . . . . [ ]
[ ][ ] Days Later Than . . . . . [ ]

1 = CUF 101
2 = Mesilla
3 = Saranac
4 = Vernal
5 = Norseman

TEST LOCATION:

4

6. PLANT COLOR (Determined from healthy regrowth 3 weeks after first spring cut, controlling leafhoppers if necessary): 9900410

[ ] 1 = Very Dark Green (524) 2 = Dark Green (Vernal) 3 = Light Green (Ranger)

COLOR CHART VALUE *(Specify chart used)* _____

APPLICATION VARIETY: _____

VERNAL: _____

TEST LOCATION: _____

7. CROWN TYPE (Determined from spaced plantings):

[ ] Noncreeping Types: 1 = Broad (Vernal) 2 = Intermediate (Saranac) 3 = Narrow (CUF 101)

Creeping Types: 4 = Creeping Rooted (Rangelander) 5 = Rhizomatous (Rhizoma)

8. FLOWER COLOR (Determine frequency of plants for each color class as defined by USDA Agricultural Handbook No. 424 (Barnes 1972), allowing all plants in plot to flower):

080	% Purple and Violet (Subclasses 1.1 to 1.4)	-	% Blue (Subclasses 2.3 and 2.4)
019	% Variegated Other Than Blue (Subclasses 2.1, 2.2, 2.5 to 2.9)	001	% Yellow (Subclasses 4.1 to 4.4)
t	% Cream (Class 3)	t	% White (Class 5)

TEST LOCATION: Connell, WA

9. POD SHAPE (Determine frequency of plants with the following pod shapes produced on well cross-pollinated racemes):

[ ] % Tightly Coiled (One or more coils, center more or less closed) [ ] % Loosely Coiled (One or more coils, center conspicuously open)

[ ] % Sickle (Less than 1 coil) TEST LOCATION: _____

10. PEST RESISTANCE: Provide in the appropriate column, trial data for application variety, and resistant (R) and susceptible (S) check varieties, synthetic generation tested, average severity index scores (ASI), least significant difference statistics (LSD .05), the institution in charge of test, year, and location of test, and whether test is a field or laboratory evaluation. Describe scoring system, and any test procedure which differs from standard methods proposed by Elgin (1982). Trial data from other test years or locations should be presented whenever available on a separate document as Exhibit D.
Seeds of the check varieties and germplasm lines listed below can be obtained from the USDA Field Crops Laboratory, Bldg. 001, Rm. 335, BARC-West, Beltsville, MD 20705. Although comparisons with check varieties listed below are preferred, comparisons with any appropriate check variety recommended by Elgin (1982) may be presented.

A. DISEASE RESISTANCE: DISEASE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION. YEAR. LOCATION. FIELD OR LABORATORY
Anthracnose, Race 1 *(Colletotrichum trifolii)*	Application HR	2	61.8	~125		% Resistant Plants 10.5	Pioneer Hi-Bred Int'l, Inc. Arlington, WI 1994 Laboratory
	Arc (R)		65.0	~125			
	Saranac (S)		2.5	~125			
	SCORING SYSTEM: Standard test						
Anthracnose, Race 2 *(Colletotrichum trifolii)*	Application						
	Saranac AR (R)						
	Arc (S)						
	SCORING SYSTEM:						
Bacterial Wilt *(Corynebacterium insidiosum)*	Application HR	2	59.1	~200		% Resistant Plants 14.2	Pioneer Hi-Bred Int'l, Inc. Arlington, WI 1994 Field
	Vernal (R)		42.0	~200			
	Narragansett (S)		3.7	~200			
	SCORING SYSTEM: Standard test						
Common Leafspot *(Pseudopeziza medicaginis)*	Application						
	MSA-CW3An3 (R						
	Ranger (S)						
	SCORING SYSTEM:						

10. A. PEST RESISTANCE (Continued):

DISEASE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION. YEAR. LOCATION. FIELD OR LABORATORY
Downy Mildew *(Peronospora trifoliorum)*	Application						
Isolate, if known:	Saranac (R)						
	Kanza (S)						
	SCORING SYSTEM:						
Fusarium Wilt *(Fusarium oxysporum f. medicaginis)*	Application HR	2	62.0	~150		% Resistant Plants 13.6	Crop Characteristics Farmington, MN 1998 Field
per letter of 3-7-2001 mah 3-15-2001	Agate (R)		54.0	~150			
	MNGN-1 (S)		0.0	~150			
	SCORING SYSTEM:	Standard test					
Phytophthora Root Rot *(Phytophthora megasperma f. medicaginis)*	Application HR	2	91.1	~160		% Resistant Plants 14.7	Pioneer Hi-Bred Int'l, Inc. Arlington, WI 1994 Laboratory
	Agate (R)		43.0	~160			
	Saranac (S)		0.0	~160			
	SCORING SYSTEM:	Standard test					
Verticillium Wilt *(Verticillium alboatrum)*	Application HR	2	61.0	~125		% Resistant Plants 17.6	Pioneer Hi-Bred Int'l, Inc. Arlington, WI 1994 Laboratory
	Vertus (R)		40.0	~125			
	Saranac (S)		3.3	~125			
	SCORING SYSTEM:	Standard test					
Other *(Specify)* Aphanomyces Root Rot (Aphanomyces euteiches)	Application MR	2	18.2	~175		% Resistant Plants 9.4	Pioneer Hi-Bred Int'l, Inc. Arlington, WI 1994 Laboratory
	WAPH-1		50.0	~175			
	Agate (S)		1.7	~175			
	SCORING SYSTEM:	Standard test					
Other *(Specify)*	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

B. INSECT RESISTANCE:

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT DEFOLIATION	DEFOLIATION IN PERCENT OF RESISTANT CHECK	ASI	ASI LSD .05	INSTITUTION. YEAR. LOCATION. FIELD OR LABORATORY
Alfalfa Weevil *(Hypera postica)*	Application						
	Arc (R)			100			
	Saranac (S)						
	SCORING SYSTEM:						

10. B. INSECT RESISTANCE (Continued):

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT SEEDLING SURVIVAL	NUMBER OF SEEDLINGS TESTED	ASI	ASI LSD .05	INSTITUTION. YEAR. LOCATION. FIELD OR LABORATORY
Blue Alfalfa Aphid *(Acyrthosiphon kondoi)*	Application						
	CUF101 (HR)						
	ARC (S)						
	SCORING SYSTEM:						
Pea Aphid *(Acyrthosiphon pisum)*	Application						
	Baker (R)						
	Caliverde (S)						
	SCORING SYSTEM:						
Spotted Alfalfa Aphid *(Therioaphis maculata)* *Biotype, if known:*	Application R	2	49.6	~300		% Resistant Plants 16.6	Pioneer Hi-Bred Int'l, Inc. Connell, WA 1995 Laboratory
	Baker (HR)		50.0	~300			
	Caliverde (S)		2.3	~300			
	SCORING SYSTEM:	Standard test					

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION. YEAR. LOCATION. FIELD OR LABORATORY
Potato Leafhopper Yellowing *(Empoasca fabae)*	Application						
	PLH25 (MR)						
	Ranger (S)						
	SCORING SYSTEM:						
Other *(Specify)*	Application						
	(S)						
	(S)						
	SCORING SYSTEM:						

C. NEMATODE RESISTANCE:

NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION. YEAR. LOCATION. FIELD OR LABORATORY
Northern Root Knot *(Meloidogyne hapla)*	Application						
	SYN YY (HR]						
	Lahontan (S)						
	SCORING SYSTEM:						

10. C. NEMATODE RESISTANCE (Continued):

NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Southern Root Knot *(Meloidogyne incognita)*	Application						
	Moapa 69 (R)						
	Lahontan (S)						
	SCORING SYSTEM:						
Stem Nematode *(Ditylenchus dipsaci)*	Application LR	2	7.6	~250		% Resistant Plants 10.2	Pioneer Hi-Bred Int'l, Inc. Connell, WA 1995 Laboratory
	Vernema (R)		60.0	~250			
	Ranger (S)		7.3	~250			
	SCORING SYSTEM: Standard test						
Other *(Specify)*	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

11. INDICATE THE VARIETY THAT MOST CLOSELY RESEMBLES THE APPLICATION VARIETY FOR EACH OF THE FOLLOWING CHARACTERS:

CHARACTER	VARIETY	CHARACTER	VARIETY
Winterhardiness	5454	Plant Color	-
Recovery After 1st Cut	5454	Crown Type	-
Area of Adaptation	5454	Combined Disease Resistance	5312
Flowering Date	-	Combined Insect Resistance	5454

REFERENCES

Barnes, D.K. 1972. A System for Visually Classifying Alfalfa Flower Color. U.S. Dep. Agric. Handb. 424. 18 pp. (Note: Greenish cast of plate 6, A and B is an artifact of printing, actual colors a blend of yellow and white.)

Elgin, J.H., Jr., (ed.). 1982. Standard Tests to Characterize Pest Resistance in Alfalfa Cultivars. U.S. Dep. Agric. Tech. Bull. (In Press).

Gunn, C.R., W.H. Skrdla, and H.C. Spencer. 1978. Classification of Medicago sativa L. using legume characters and flower colors. U.S. Dep. Agric. Tech. Bull. 1574. 84 pp.

Munsell Color Co. 1977. Munsell Plant Tissue Color Charts. Munsell Color Co., Inc. Baltimore.

NOTE: Any additional descriptive information and supporting documentation may be provided as Exhibit D.

9900410

EXHIBIT D

'54V54'

1. 54V54 is a 20 clone synthetic variety with seed of each parent bulked equally. Breeder seed (syn. 2) was produced on 223 plants under cage isolation in Connell, WA during the summer of 1993. Parental material was selected phenotypically for resistance to one or more of the following pests: bacterial wilt, *Fusarium* Wilt, *Verticillium* Wilt, *Phytophthora* root rot, anthracnose (race 1), *Aphanomyces* root rot (race 1), and spotted alfalfa aphid. In addition, parent clones were selected genotypically for forage yield, forage quality, fall dormancy, regrowth vigor, and persistence. 54V54 traces to the following germplasm sources: 5331 (13%), Apollo (6%), 526 (5%), 5262 (5%), 532 (4%), NCMP10 (4%), DK120 (3%), Saranac AR (3%), 545 (3%), Apollo II (2%), Anchor (2%), WL316 (2%), 524 (1%), 5444 (1%), Conquest (1%), Mercury (1%), 5432 (1%), Culver (1%), Vernal (1%), with minor contributions (totaling 2.5%) from: Team, Armor, Narragansett, Cherokee, Saranac, ATRA 55, MSB-W4, Magnum, Futura, 555, Endure, 5364, Iroquois, Arnim and others. The remaining 40.5% traces to various Pioneer experimentals. Original germplasm sources are as follows: M. falcata (2.6%), Ladak (4.0%), M. varia (12.7%), Turkistan (2.1%), Flemish (25.3%), Chilean (2.9%) and unknown (50.4%).

2. 54V54 is adapted to the north central, east central, and winterhardy intermountain regions of the United States. It is intended for use in the North Central, East Central, Great Plains, moderately winterhardy regions of the United States and Ontario, Canada. It has been tested in Iowa, Pennsylvania, Oregon, Washington, Wisconsin and Minnesota.

3. 54V54 is a moderately dormant cultivar with a fall dormancy similar to Saranac. Growth habit is erect in the summer, and semi-erect in the fall. Flower color in the syn. 2 generation is 80.4% purple, 19.1% variegated, 0.5% yellow with traces of cream and white.

4. 54V54 has high resistance to anthracnose (race 1), bacterial wilt, *Fusarium* Wilt, *Verticillium* Wilt, and *Phytophthora* root rot; resistance to spotted alfalfa aphid; moderate resistance to Aphanomyces root rot (race 1), and low resistance to stem nematode. 54V54 has not been tested for the pea aphid nor blue aphid.

5. Breeder seed (Syn 2) was produced on 223 parents representing approximately equal contributions from the 20 parental clones during the summer of 1993 under cage isolation in Connell, WA. Seed classes will be breeder, foundation (Syn 3 or Syn 4), and certified (Syn 3, Syn 4, Syn 5). Foundation seed may be produced from breeder or foundation. The second generation foundation (Syn 4) may be produced at the discretion of Pioneer Hi-Bred International, Inc. Limitations on age of stand will be one, three, and five years respectively for breeder, foundation seed and certified seed. Sufficient breeder and/or foundation seed for the projected life of the variety will be maintained by Pioneer Hi-Bred International, Inc.

6. Seed will be marketed in the fall of 1999.

7. As a means of added varietal protection, information included with the application for Review of Alfalfa Varieties for Certification may be provided to the PVP office.

8. Variety name: 54V54 Date submitted: November 23, 1998.

9. Experimental designations:X54V54, Y53V53

REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055 EXPIRES: 12-31-96

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Pioneer Hi-Bred International, Inc.	X54V54	54V54

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*	5. TELEPHONE *(include area code)*	6. FAX *(include area code)*
7305 N.W. 62nd Ave. P.O. Box 287 Johnston, IA 50131	(515) 270-3347	(515) 270-3750
	7. PVPO NUMBER	9900410

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* If no, please explain. [X] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? [X] YES [ ] NO
If no, give name of country _____

10. Is the applicant the original breeder? If no, please answer the following: [ ] YES [ ] NO

a. If original rights to variety were owned by individual(s):
Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country _____

[X] YES [ ] NO

b. If original rights to variety were owned by a company:
Is the original breeder(s) U.S. based company? If no, give name of country _____

11. Additional explanation on ownership *(If needed, use reverse for extra space):*

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeders(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original breeder, both the original breeder and the applicant must meet one of the above criteria.

The original breeder may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.